UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/075,972	02/14/2002	Terry L. Fruehling	60,408-126	9274

22851 7590 01/05/2005

DELPHI TECHNOLOGIES, INC.
M/C 480-410-202
PO BOX 5052
TROY, MI 48007

EXAMINER	
DUNCAN, MARC M	

ART UNIT	PAPER NUMBER
2113	

DATE MAILED: 01/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/075,972	FRUEHLING ET AL.	
	Examiner	Art Unit	
	Marc M Duncan	2113	

-- Th MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 October 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-58* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5,9-14,16-28,32-41 and 43-58* is/are rejected.

7)☒ Claim(s) *6-8,15,29-31 and 42* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *14 February 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Status of the Claims

Claims 1, 2, 3, 4, 9, 10, 11, 12, 13, 18, 19, 20, 21, 22, 24, 25, 26, 27, 32, 33, 34, 35, 36, 38, 39, 40, 45, 46, 47, 48, 49, 51, 52, 53, 54, 55, 57 and 58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fennel et al. in view of Cutts, Jr. et al.

Claims 5, 14, 28 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fennel et al. in view of Cutts, Jr. et al.

Claims 16, 17, 43 and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fennel and Cutts, Jr. as applied to claims 11 and 34 above, and further in view of Dutton et al.

Claims 23, 37, 50 and 56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fennel and Cutts, Jr. as applied to claims 22, 36, 49 and 55 above, and further in view of Discenzo.

Claims 6-8, 15, 29-31 and 42 are objected to.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1, 2, 3, 4, 9, 10, 11, 12, 13, 18, 19, 20, 21, 22, 24, 25, 26, 27, 32, 33, 34, 35, 36, 38, 39, 40, 45, 46, 47, 48, 49, 51, 52, 53, 54, 55, 57 and 58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fennel et al. in view of Cutts, Jr. et al.

Regarding claim 1:

Fennel teaches a primary processing unit in Fig. 2 and col. 1 lines 55-56.

Fennel teaches a secondary processing unit coupled to the primary processing unit in Fig. 2 and col. 1 lines 49-50.

Fennel teaches wherein the primary and secondary processing units are adapted to run a control algorithm in col. 1 lines 43-53.

Fennel teaches a functional compare module coupled to the primary processing unit and the secondary processing unit for comparing a primary output of the primary processing unit and a secondary output of the secondary processing units after the control algorithm has been run by the primary and secondary processing units in col. 1 lines 43-53.

Fennel does not explicitly teach a common memory connected to each processing unit. Fennel does, however, teach both processing units running the same control algorithm and processing the same data.

Cutts, Jr. teaches a common memory connected to each processing unit in Fig. 1. col. 5 lines 5-8 and lines 37-45.

It would have been obvious to one of ordinary skill in the art at the time of invention to combine the shared memory of Cutts, Jr. with the processing units of Fennel.

One of ordinary skill in the art at the time of invention would have been motivated to combine the teachings because Fennel teaches that both processing units perform the same control algorithm and process the same data. Fennel also expresses a need to minimize the number of components utilized in col. 1 lines 60-61. The shared memory of Cutts, Jr. meets both needs of Fennel by providing the same data for each processing unit in a shared memory, thereby reducing the number of necessary components.

Regarding claim 2:

Fennel teaches wherein the functional compare module is adapted to detect a fault if the primary output and the secondary output are not the same in col. 1 lines 43-53.

Regarding claim 3:

Fennel teaches wherein the primary output and the secondary output are data in col. 1 lines 50-53.

Regarding claim 4:

Fennel teaches wherein the primary output and the secondary output are control signals in col. 1 lines 50-53. The processing units of Fennel are control units and therefore necessarily produce control signals as their output data.

Regarding claim 9:

Fennel teaches wherein the primary processing unit is coupled to a system for control of the system, and wherein the secondary processing unit is adapted to control the system if a fault is detected in the primary processing unit in col. 1 lines 56-66 and col. 2 lines 26-29.

Regarding claim 10:

Fennel teaches wherein the secondary processing unit is coupled to a second system for control of the second system in col. 1 lines 64-66 and col. 2 lines 1-4.

Regarding claim 11:

The teachings of Fennel and Cutts, Jr. are outlined above.

Fennel also teaches reading a control algorithm stored in the common memory by the primary processing unit in col. 2 lines 7-10. Providing data to the control unit for performing the controlling task is equivalent to reading the control program.

Fennel also teaches reading the control algorithm stored in the common memory by the secondary processing unit in col. 2 lines 7-10. Both of the control units receive the data necessary for control.

Regarding claim 12:

Fennel teaches wherein the primary output and the secondary output are data in col. 1 lines 50-53.

Regarding claim 13:

Fennel teaches wherein the primary output and the secondary output are control signals in col. 1 lines 50-53. The processing units of Fennel are control units and therefore necessarily produce control signals as their output data.

Regarding claim 18:

Fennel teaches wherein the primary processing unit is coupled to a system for control of the system, and wherein the secondary processing unit is adapted to control the system if a fault is detected in the primary processing unit in col. 1 lines 56-66 and col. 2 lines 26-29.

Regarding claim 19:

Fennel teaches wherein the secondary processing unit is coupled to a second system for control of the second system in col. 1 lines 64-66 and col. 2 lines 1-4.

Regarding claim 20:

See the teachings of Fennel and Cutts, Jr. outlined above.

Fennel further teaches that the apparatus controls a first system of a motor vehicle in the Title.

Regarding claim 21:

Fennel teaches the first system being a brake system in the Title. An automobile inherently includes a brake system.

Regarding claim 22:

Fennel teaches the first system being a steering system in the Title. An automobile inherently includes a steering system.

Regarding claim 24:

Fennel teaches the first system being an engine control system in the Title. An automobile inherently includes an engine control system.

Regarding claim 25:

Fennel teaches wherein the functional compare module is adapted to detect a fault if the primary output and the secondary output are not the same in col. 1 lines 43-53.

Regarding claim 26:

Fennel teaches wherein the primary output and the secondary output are data in col. 1 lines 50-53.

Regarding claim 27:

Fennel teaches wherein the primary output and the secondary output are control signals in col. 1 lines 50-53. The processing units of Fennel are control units and therefore necessarily produce control signals as their output data.

Regarding claim 32:

Fennel teaches wherein the secondary processing unit is adapted to control the system if a fault is detected in the primary processing unit in col. 1 lines 56-66 and col. 2 lines 26-29.

Regarding claim 33:

Fennel teaches wherein the secondary processing unit is coupled to a second system for control of the second system in col. 1 lines 64-66 and col. 2 lines 1-4.

Regarding claim 34:

See the teachings of Fennel and Cutts, Jr. outlined in the rejections of claims 1 and 11.

Fennel further teaches that the controller is for use in a motor vehicle in the Title.

Regarding claim 35:

Fennel teaches wherein the primary processing unit controls a brake system in the Title. An automobile inherently includes a brake system.

Regarding claim 36:

Fennel teaches wherein the primary processing unit controls a steering system in the Title. An automobile inherently includes a steering system.

Regarding claim 38:

Fennel teaches wherein the primary processing unit controls an engine control system in the Title. An automobile inherently includes an engine control system.

Regarding claim 39:

Fennel teaches wherein the primary output and the secondary output are data in col. 1 lines 50-53.

Regarding claim 40:

Fennel teaches wherein the primary output and the secondary output are control signals in col. 1 lines 50-53. The processing units of Fennel are control units and therefore necessarily produce control signals as their output data.

Regarding claim 45:

Fennel teaches wherein the primary processing unit is coupled to a system for control of the system, and wherein the secondary processing unit is adapted to control the system if a fault is detected in the primary processing unit in col. 1 lines 56-66 and col. 2 lines 26-29.

Regarding claim 46:

Fennel teaches wherein the secondary processing unit is coupled to a second system for control of the second system in col. 1 lines 64-66 and col. 2 lines 1-4.

Regarding claim 47:

Fennel teaches a primary processing unit couple to the motor vehicle and adapted to perform a first set of functions in Fig. 2 and col. 1 lines 55-56.

Fennel teaches a secondary processing unit coupled to the motor vehicle and to the primary processing unit and adapted to perform a primary set of test functions in Fig. 2 and col. 1 lines 49-50.

Fennel teaches wherein the primary processing unit is adapted to run a control algorithm in col. 1 lines 43-53.

Fennel teaches a functional compare module coupled to the primary processing unit and the secondary processing unit for comparing a primary output of the primary processing unit and a secondary output of the secondary processing units after the control algorithm has been run by the primary and secondary processing units in col. 1 lines 43-53.

Fennel teaches that the secondary processing unit is adapted to perform the first set of functions upon detection of a fault in the primary processing unit in col. 2 lines 26-29.

Fennel does not explicitly teach a common memory connected to each processing unit. Fennel does, however, teach both processing units running the same control algorithm and processing the same data.

Cutts, Jr. teaches a common memory connected to each processing unit in col. 1 lines 15-16.

It would have been obvious to one of ordinary skill in the art at the time of invention to combine the shared memory of Cutts, Jr. with the processing units of Fennel.

One of ordinary skill in the art at the time of invention would have been motivated to combine the teachings because Fennel teaches that both processing units perform the same control algorithm and process the same data. Fennel also expresses a need to minimize the number of components utilized in col. 1 lines 60-61. The shared memory of Cutts, Jr. meets both needs of Fennel by providing the same data for each processing unit in a single shared memory, thereby reducing the number of necessary components.

Regarding claim 48:

Fennel teaches wherein the primary processing unit controls a brake system in the Title. An automobile inherently includes a brake system.

Regarding claim 49:

Fennel teaches wherein the primary processing unit controls a steering system in the Title. An automobile inherently includes a steering system.

Regarding claim 51:

Fennel teaches wherein the primary processing unit controls an engine control system in the Title. An automobile inherently includes an engine control system.

Regarding claim 52:

Fennel teaches wherein the secondary processing unit is adapted to perform a second set of functions, and wherein the primary processing unit is adapted to perform a set of secondary test functions, and wherein the functional compare module is adapted to detect a fault in the secondary processing unit, wherein the primary processing unit is adapted to perform the second set of functions upon detection of a fault in the secondary processing unit in col. 1 lines 56-66, col. 2 lines 26-29 and col. 2 lines 49-50. If the units are performing mutual tests, they also perform mutual takeover in case of faults.

Regarding claim 53:

The claim is rejected as the method of using the apparatus of claim 45.

Regarding claim 54:

Fennel teaches wherein the primary processing unit controls a brake system in the Title. An automobile inherently includes a brake system.

Regarding claim 55:

Fennel teaches wherein the primary processing unit controls a steering system in the Title. An automobile inherently includes a steering system.

Regarding claim 57:

Fennel teaches wherein the primary processing unit controls an engine control system in the Title. An automobile inherently includes an engine control system.

Regarding claim 58:

Fennel teaches the steps of: performing a second set of functions by the secondary processing unit; performing a set of secondary test functions by the primary

processing unit; and, wherein the secondary processing unit is adapted to perform a set of secondary test functions, and responsively detecting a fault in the secondary processing unit; and, performing the second set of functions by the primary processing unit upon detection of a fault in the secondary processing unit in col. 1 lines 56-66, col. 2 lines 26-29 and col. 2 lines 49-50. If the units are performing mutual tests, they also perform mutual takeover in case of faults.

Claims 5, 14, 28 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fennel et al. in view of Cutts, Jr. et al.

Regarding claims 5, 14, 28 and 41:

The teachings of Fennel and Cutts, Jr. are outlined above.

Fennel and Cutts, Jr. do not explicitly teach performing diagnostics at startup. Fennel and Cutts, Jr. do, however, teach performing diagnostics for system reliability and safety concerns.

The examiner takes official notice that performing diagnostics at startup of a controller was well known and widely used by those of ordinary skill in the art at the time of invention.

It would have been obvious to one of ordinary skill in the art at the time of invention to combine startup diagnostics with the diagnostic teachings of Fennel and Cutts, Jr.

One of ordinary skill in the art at the time of invention would have been motivated to combine the teachings because performing diagnostics at startup of a controller allows for the functionality of the controller to be determined before any attempt is made

to use a possibly non-functional or degraded controller. The use of startup diagnostics, therefore, provides added reliability and safety to the system utilizing the controller.

Claims 16, 17, 43 and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fennel and Cutts, Jr. as applied to claims 11 and 34 above, and further in view of Dutton et al.

Regarding claims 16 and 43:

The teachings of Fennel and Cutts, Jr. are outlined above.

Fennel and Cutts, Jr. do not explicitly teach generating a signature of signals and comparing the generated signature with a reference signal to detect a fault. Fennel and Cutts, Jr. do, however, teach comparing the outputs of processing units in order to detect faults.

Dutton teaches generating a signature of signals and comparing the generated signature with a reference signal to detect a fault in the Abstract lines 11-16.

It would have been obvious to one of ordinary skill in the art at the time of invention to combine the signatures of Dutton with the fault detecting of Fennel and Cutts, Jr.

One of ordinary skill in the art at the time of invention would have been motivated to combine the teachings because Fennel and Cutts, Jr. express a need to compare the outputs of processing units to one another to detect a fault. Dutton meets that need with the use of signature generation to compare output signals.

Regarding claims 17 and 44:

Dutton teaches the at least one bus includes an address bus, a data bus and a control bus in Fig. 2. Dutton teaches processors. It is inherent in the structure of a processor to include an address bus, a data bus and a control bus.

Claims 23, 37, 50 and 56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fennel and Cutts, Jr. as applied to claims 22, 36, 49 and 55 above, and further in view of Discenzo.

Regarding claims 23, 37, 50 and 56:

The teachings of Fennel and Cutts, Jr. are outlined above.

Fennel and Cutts, Jr. do not explicitly teach the steering system being a steer by wire system. Fennel and Cutts, Jr. do, however, inherently teach a steering system.

Discenzo teaches a steer by wire system in the Title.

It would have been obvious to one of ordinary skill in the art at the time of invention to combine the steer by wire system of Discenzo with the steering system of Fennel and Cutts, Jr.

One of ordinary skill in the art at the time of invention would have been motivated to combine the teachings because the steer by wire system eliminates a number of required mechanical connections and components (Discenzo col. 1 lines 27-29).

Allowable Subject Matter

Claims 6-8, 15, 29-31 and 42 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: Prior art was not found that explicitly teaches or fairly suggests at least one peripheral module coupled to the primary processing unit, wherein the at least one peripheral nodule includes a built in self test circuit for detecting faults within the peripheral module, the built in self test circuit being coupled to the primary processing unit as outlined in claims 6, 15, 29 and 42. Prior art was not found that explicitly teaches or fairly suggests the functional compare module generating signatures as outlined in claims 7 and 30.

Response to Arguments

Applicant's arguments filed 10/20/04 have been fully considered but they are not persuasive.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., a separate function control module) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Applicant does not claim the function control module being separate from the microprocessors.

Applicant's arguments with respect to the teachings of the Cutts, Jr. reference have been considered, but are no longer relevant due to the new grounds of rejection.

In response to applicant's arguments that Fennel does not teach each processor reading the control algorithm, the examiner respectfully disagrees. Applicant has stated

that the two processing units process the same data *apparently* by sending the data from the first processing unit to the second processing unit. Applicant further stated that because of this apparent function of Fennel, the lines cited by the examiner do not teach the second processing unit reading the control algorithm. Applicant appears to have taken these lines out of the context of the surrounding section. Fennel clearly points out in the Abstract and in the section from which the examiner cited the lines in question that "sending the data necessary for performing the controlling or regulating task of the first control unit directly to the further control unit is also possible." Fennel also states that "This method differs from the other preferred methods in that the data are directly sent to the at least one further control unit. Admittedly, this increases wiring efforts and structure, but also improves the scope of performance." It was this teaching that the examiner cited and relied upon. This teaching of Fennel clearly states that the data necessary for the control task are communicated directly to the further control unit and are not required to be sent from the first control unit. The examiner maintains the rejection.

The remainder of applicant's arguments all depend on the assumption that Fennel does not teach the second processing unit reading the control algorithm, the separate function control module that is argued but not claimed or the combination with the Heugel reference that no longer exists.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marc M Duncan whose telephone number is 571-272-3646. The examiner can normally be reached on M-T and TH-F 6:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Beausoliel can be reached on 571-272-3645. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

md

NADEEM IQBAL
PRIMARY EXAMINER